Class 349 LIQUID CRYSTAL CELLS, ELEMENTS AND SYSTEMS

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1	**LIQUID CRYSTAL SYSTEM**
2	. Liquid crystal for recording or imaging on photosensitive medium
3	.. Printer or print bar
4	.. Exposure device for lithography
5	. Projector including liquid crystal cell (s)
6	.. Overhead projector
7	.. Video/motion picture projector
8	.. Plural light path projectors
9	... Having light separated into S and P polarization
10	... Wherein liquid crystal cells include microencapsulated or polymer dispersed liquid crystal
11	. Heads-up display
12	. Liquid crystal writing tablet
13	. Liquid crystal eyewear (glasses, goggles, etc.) — 351/158
14	.. For protection
15	. Stereoscopic
16	. Liquid crystal window
17	. Computational system employing liquid crystal element (neural network, correlation device, optical computer)
18	. Variable or rotatable retarder used with other retarders to produce filtering effects (Solc, Lyot, Partial)
19	**PARTICULAR EXCITATION OF LIQUID CRYSTAL**
20	. Thermal excitation
21	.. By heating electrode
22	.. By light beam heating (e.g., IR, laser, etc.)
23	. Magnetic or pressure excitation
24	. Optical excitation
25	.. With photoconductive layer (e.g., spatial light modulator(SLMs))
26	... Of an alloy of S, Se, or Te
27	... With silicon photoconductive layer
28	.... With silicon photodiode, N-I-N photoconductor structure, or P-I-P photoconductor structure
29	... With particular light blocking layer for separating read and write lights
30	... With particular dielectric mirror for spatial light modulator (i.e., SLM)
31	. Electron beam excitation
32	. Plasma excitation
33	. Electrical excitation of liquid crystal (i.e., particular voltage pulses, AC vs. DC, threshold voltages, etc.)
34	.. With application of holding or bias voltage (i.e., voltage which does not change the optical state of the liquid crystal)
35	.. For driving Grandjean to focal conic or dynamic scattering type liquid crystal
36	.. Including diverse driving frequencies
37	.. Polarity based driving
38	.. With supplemental capacitor
39	... In active matrix with separate dedicated capacitor line
40	.. With antistatic elements
41	.. With particular switching device
42	... Transistor

43 .... Structure of transistor
44 ..... With light block conductively connected to transistor
45 ..... Transferred transistor
46 ..... With particular gate electrode structure
47 ..... With gate electrode between liquid crystal and semiconductor layer
48 .... Plural nonredundant transistors per pixel
49 ... Two terminal nonlinear switching device (e.g., N-I-N, S-I-S, Ferroelectric, etc.)
50 .... Diode
51 .... Metal-insulator-metal (i.e., MIM)
52 ..... With particular insulating layer
53 .... Varistor
54 .. Matrix including additional element (s) which correct or compensate for electrical fault
55 ... Laser links
56 PARTICULAR STRUCTURE
57 . Lens or prism separate from projection system (i.e., it is not integral part of illumination system)
58 . Holder, support, frame, or housing
59 .. Including electromagnetic shielding
60 .. Including resilient support member
61 . Particular illumination
62 .. With integral optical element for guiding or distributing light from the light source
63 ... Specifically for guiding light in a front-lit device
64 ... Diffuser between light source and liquid crystal
65 ... Edge lit type light guide behind liquid crystal
66 ... Louvres
67 ... Reflector having particular shape behind light source
68 .. With plural diverse light sources (e.g., for day and night)
69 .. Electroluminescent light source
70 .. Fluorescent light source
71 ... Formed of planar phosphor or fluorescent layer separate from illumination source
72 . Detector of liquid crystal temperature
73 . Interconnection of plural cells in parallel (e.g., edge to edge)
74 . Interconnection of plural cells in series
75 .. For compensation of birefringence effects
76 ... Of twisted (or chiral) nematic or supertwisted nematic liquid crystal
77 .. With particular cooperation between cells (e.g., alternating selection or simultaneous selection of cells)
78 ... Cell cooperation providing multicolor display
79 .... With color formed by different dye in each cell
80 .... With color formed by different color polarizer or color filter associated with each cell
81 ... With cells being substantially identical and driven simultaneously, providing improved contrast
82 ... With projection of electrodes in one cell substantially nonoverlapping that of another cell (i.e., for improving resolution)
83 ... With each cell displaying a different pattern
84 . Having significant detail of cell structure only
85 .. Producing a greyscale effect
86 .. Microencapsulated or polymer dispersed liquid crystal
87 ... For variable polarizer
88 ... Polymer network liquid crystal
89 ... With particular encapsulating medium
90 .... With second material between liquid crystal and encapsulating medium
91 .... With nonpolymer encapsulating medium
92 ... Formed by particular technique
93 .... Having UV polymerized element
94 .... Formed with particular alignment technique

95 .. Microlenses
96 .. Polarizer
97 ... Color
98 ... Circular
99 ... With particular non-zero angle between polarization axis and orientation direction
100 .... For ferroelectric liquid crystal
101 .... For supertwisted nematic liquid crystal
102 ... With particular non-zero angle between polarization axis and compensator optical axis
103 ... With particular non-zero and non-90 angle between opposite polarization axes
104 .. Filter
105 ... Interference filter
106 ... Color filter
107 .... With different liquid crystal thickness for each color of filter
108 .... With plural colors for each display element (i.e., each pixel or segment)
109 .... With unequal areas for different colors or with fractional shift between one line of colors and the next
110 ... Opaque mask or black mask
111 .... Conductive mask
112 .. Diffuser (on viewer side of liquid crystal)
113 .. Reflector
114 ... Dielectric mirror (i.e., in devices excited other than by photoconductive layer) or transflector
115 ... Cholesteric reflector
116 .. Photoconductive element (i.e., not used for exciting)
117 .. Compensator or retarder (i.e., not using liquid crystal cell)
118 ... With refractive indices in the x, y, and z directions
119 ... Multiple compensators
120 .... Including at least one with negative intrinsic birefringence
121 ... With particular non-zero angle between compensator optical axis and orientation direction
122 .. Particular nonoptical film or layer (e.g., adhesive layer, barrier layer)
123 ... Alignment layer
124 .... Formed by particular technique (e.g., Langmuir Blodgett, stretching, etc.)
125 ..... Having particular deposited structure (e.g., angled, plural layered) produced by vapor deposition
126 ..... Having structure produced by rubbing under particular rubbing conditions (e.g., particular direction, rubbing force, by using named rubbing material or roller, etc.)
127 .... Formed of a liquid crystal material
128 .... With different alignments on opposite substrates
129 .... With plural alignments on the same substrate
130 .... For perpendicular alignment
131 ..... Silanes
132 .... For parallel alignment
133 ..... With chiral smectic liquid crystal (includes ferroelectric liquid crystal)
134 ..... With particular pretilt angle from the alignment layer
135 ..... With particular polymer composition of the alignment layer (e.g., fluorine-containing aliphatic polyamide)
136 ..... With particular pretilt angle (i.e., with liquid crystal other than chiral smectic)
137 ... Antireflection layer
138 ... Insulating layer
139 .. Electrode or bus detail (i.e., excluding supplemental capacitor and transistor electrodes)
140 ... Formed of semiconductor material
141 ... Interdigited (comb-shaped) electrodes
142 ... Segmented or fixed pattern
143 ... Matrix electrodes
144 .... Split pixels

145 .... Nonrectilinear rows and columns
146 .... Nonrectangular (odd) shaped pixels
147 .... Multilayer electrodes
148 .... Resistance reducing electrodes
149 ... Having connection detail to external circuit
150 .... Featuring flexible circuit (i.e., tape automated bonding (TAB), etc.)
151 .... With driving circuit having input and output electrodes on liquid crystal substrate
152 .... With detail of terminals to external circuit
153 .. Liquid crystal seal
154 ... With particular injection port or injection plug
155 .. Spacer
156 ... Formed as walls (e.g., between pixels) or integral with substrate
157 ... Plural types in single liquid crystal cell
158 .. Substrate
159 ... Fiberoptic faceplate
160 ... With particular topology (i.e., other than for diffraction and spacers)
161 .. Heating or cooling element other than for exciting
162 .. Dual function layer or element
163 .. Nonchiral additive in the liquid crystal material
164 ... Fluorescent additive
165 ... Pleochroic dye
166 ... Nonspacer particles significantly smaller than liquid crystal thickness (e.g., scattering centers, ferromagnetic particles, etc.)
167 WITH SPECIFIED NONCHEMICAL CHARACTERISTIC OF LIQUID CRYSTAL MATERIAL
168 . Utilizing change between diverse phases (e.g., cholesteric to nematic)
169 . Utilizing change within liquid crystal phase (e.g., Grandjean to focal conic, etc.)
170 . Utilizing reversal in sign of dielectric anisotropy
171 . Within smectic phase
172 .. Within chiral smectic phase (includes ferroelectric)
173 ... Greyscale resulting from liquid crystal property other than solely Smectic A
174 ... Antiferroelectric
175 . Within cholesteric phase
176 .. Using reflection characteristic
177 . Within nematic phase
178 .. Negative dielectric anisotropy only
179 .. Twisted (or chiral) nematic or supertwisted nematic
180 ... Having particular parameter of twist
181 ... Having particular birefringence or retardation
182 CELL CONTAINING LIQUID CRYSTAL OF SPECIFIC COMPOSITION
183 . Polymer liquid crystal
184 . In smectic phase
185 . In cholesteric phase
186 . In nematic phase
187 NOMINAL MANUFACTURING METHODS OR POST MANUFACTURING PROCESSING OF LIQUID CRYSTAL CELL
188 . Changing liquid crystal phase
189 . Injecting liquid crystal
190 . Sealing of liquid crystal
191 . Aligning liquid crystal with means other than alignment layer
192 . Defect correction or compensation
193 LIQUID CRYSTAL OPTICAL ELEMENT
194 . Passive liquid crystal polarizer
195 . Antidazzle mirror formed from liquid crystal cell
196 . Beam dividing switch formed from liquid crystal cell
197 .. Including passive liquid crystal switch portion
198 . Liquid crystal etalon
199 . Liquid crystal sensors (e.g., voltmeters, pressure sensors, temperature sensors)

200 . Liquid crystal lenses other than for eyewear
201 . Liquid crystal diffraction element
202 .. For beam steering

FOREIGN ART COLLECTIONS

FOR000 **CLASS-RELATED FOREIGN DOCUMENTS**

Any foreign patents or non-patent literature from subclasses that have been reclassified have been transferred directly to FOR Collection listed below. These collections contain ONLY foreign patents or nonpatent literature. The parenthetical references in the Collection titles refer to the abolished subclasses from which these Collections were derived.

UTILIZING A LIQUID CRYSTAL MATERIAL (359/36)

FOR100 . With particular illumination (359/48)

FOR101 .. Having optical element (e.g., curved reflector behind light source, etc.) (359/49)

FOR102 .. Fluorescent light (e.g., FLAD type) (359/50)

FOR103 . Microencapsulated liquid crystal (359/51)

FOR104 .. With particular encapsulating medium (359/52)

FOR105 . Plural contiguous cells (359/53)

FOR106 . Having electrodes arranged into rows and columns (359/54)

FOR107 .. With liquid crystal electrode excitation (359/55)

FOR108 ... For ferroelectric liquid crystal (359/56)

FOR109 ... With particular switching device (359/57)

FOR110 .. With particular switching device (359/58)

FOR111 ... Transistor (359/59)

FOR112 ... Diode (359/60)

FOR113 . Having particular nonelectrical detail of cell structure enclosing or adjacent liquid crystal material (359/62)

FOR114 .. Polarizer (359/63)

FOR115 ... Color (359/64)

FOR116 ... Circular (359/65)

FOR117 .. Diffuser (359/69)

FOR118 ... Dielectric mirror or transflector (359/71)

FOR119 .. Particular nonoptical film or layer (e.g., adhesive layer, barrier layer, etc.) (359/74)

FOR120 ... Alignment layer (359/75)

FOR121 .... Formed by particular technique (e.g., vapor deposition, rubbing, etc.) (359/76)

FOR122 .... For perpendicular alignment (359/77)

FOR123 .... For parallel alignment (359/78)

FOR124 .. Substrate (359/82)

FOR125 .. Holder, support, or frame (359/83)

FOR126 . With specified electrode excitation characteristic of liquid crystal material (359/84)

FOR127 .. Provided by particular circuit (359/85)

FOR128 . With detector of liquid crystal temperature (359/86)

FOR129 . Electrode detail (359/87)

FOR130 .. Reversal in sign of dielectric anisotropy (359/92)

FOR131 . Birefringers effect (359/93)

FOR132 . Variable index of refraction (359/94)

FOR133 . Variable diffraction (359/95)

FOR134 . Variable absorption of light due to an additive in the liquid crystal material (359/96)

FOR135 .. Flurescent additive (359/97)

FOR136 .. Pleochroic dye (359/98)

FOR137 . With specified nonchemical characteristic of liquid crystal material (359/99)

FOR138 .. Within smectic phase (359/100)

FOR139 .. Within cholestric phase (359/101)

FOR140 .. Within nematic phase (359/102)

FOR141 . Cell containing liquid crystal of specified composition (359/103)

FOR142 .. In smectic phase (359/104)

FOR143 .. In cholesteric phase (359/105)

FOR144 .. In nematic phase (359/106)
